Evan Anthony Kalina

Education

Ph.D., Atmospheric and Oceanic Sciences, University of Colorado, Boulder, CO
Dates attended: August 2010–May 2015
Thesis: Using disdrometer, radar, lightning, and model data to investigate severe thunderstorm microphysics
Thesis committee: Katja Friedrich (adviser), George Bryan, John Cassano, Jeffrey Thayer, Brian Toon

Graduate certificate in remote sensing (awarded 9 May 2014)

B.S., Meteorology (with Honors), Florida State University, Tallahassee, FL
Dates Attended: August 2007–May 2010
Minors: Mathematics, Physics
Thesis: Predicting the initiation of cloud-to-ground lightning
Thesis director: Henry Fuelberg

Work Experience

Research Associate, NOAA/ESRL/Physical Sciences Division and NOAA/AOML/Hurricane Research Division
Dates: June 2015–Present
- Led a research team from NOAA/PSD, CIRES, NOAA/HRD, NCAR, and the University of Hawaii to use profiling and dual-polarization scanning radars to quantify ice water path contributions from ice crystals, snow, and graupel, in tropical cyclones.
- Assisted in the mission planning and deployment of the Coyote Unmanned Aircraft System (UAS) into tropical cyclones to collect low-altitude meteorological and oceanographic data.
- Analyzed Coyote UAS data to ensure proper functioning of the system, facilitate preparation of conference presentations and peer-reviewed manuscripts, and to estimate the eddy dissipation rate in the tropical cyclone boundary layer.
- Assisted in the quality control and validation of sea surface temperatures measured by infrared-sensing dropsondes by analyzing Tail Doppler Radar (TDR) data and determining which dropsondes were launched in heavy precipitation.
- Wrote a software package to update the Tropical Cyclone Buoy Database (TCBD) in an automated fashion. The new database consists of over 300 000 buoy measurements from 1970–2014, all collected within 1000 km of a tropical cyclone.

Graduate Research Assistant, University of Colorado, Boulder, CO
Dates: January 2011–May 2015
- Independently designed, conducted, and analyzed Weather Research and Forecasting (WRF) model simulations to investigate how changes in aerosol concentration would affect supercell thunderstorm microphysical, thermodynamic, and precipitation processes.

- Trained other graduate students and a professor to use the WRF model for idealized and real-data case studies. Wrote a detailed guide to compiling, running, and debugging the model that was distributed to others in the department.
- Analyzed disdrometer and dual-polarization radar data from the 2013 Great Colorado Flood to quantify precipitation characteristics of this extreme event.
- Investigated radar and lightning characteristics of thunderstorms that produced accumulating hail (15–60 cm deep) in the Denver metro area and derived a radar-based algorithm to identify these storms in real time.
- Quality controlled and analyzed particle size distributions and dual-polarization mobile radar data collected during the second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX2) to quantify the accuracy of the mobile radar data.
- Published the above results in the peer-reviewed scientific literature and presented at local and national conferences (please see peer-reviewed publications).

Student Volunteer, NOAA/NWS/Denver-Boulder WFO, Boulder, CO

Dates: February 2014–August 2014

- Analyzed real-time weather information (e.g., model, radar, lightning, satellite, and surface observations) and used the data to prepare nowcasts, evening climate reports, and weather story graphics for public issuance.
- Recorded weather forecasts on the automated phone system.
- Answered phone calls from the public requesting weather information and recorded severe weather reports.
- Conducted phone interviews with local media outlets to provide weather and climate information.
- Posted severe weather watches and warnings to the WFO Denver-Boulder Facebook and Twitter pages to raise public awareness of high-impact weather events. Trained a staff member to use social media for this purpose.
- Broadcasted severe weather watches and warnings on the National Warning System (NAWAS).
- Presented preliminary results on the radar and lightning characteristics of accumulating hailstorms to forecasters and other staff members and received their feedback.

Teaching Assistant, University of Colorado, Boulder, CO

Dates: August 2010–December 2010

- Graded all homework assignments and exams, held office hours to teach and review course material with students, and delivered guest lectures.

Research Assistant, University of Colorado, Boulder, CO

Dates: May 2010–August 2010

- Deployed optical disdrometers and mobile surface weather stations in advance of severe thunderstorms during the second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX2).

Student Intern, NOAA/AOML/Hurricane Research Division, Miami, FL

Dates: May 2009–August 2009

- Analyzed air-sea flux data from the Tropical Cyclone Buoy Database and correlated these data with tropical cyclone intensity change. This work contributed to Kaplan et al. (2010).

Grants, Honors, and Awards

2015 National Research Council (NRC) Research Associateship
2014 Best Poster (Earth System and Space Science Poster Conference, University of Colorado)
2014 Atmospheric and Oceanic Sciences University Fellowship (Travel Grant)
2010 National Science Foundation Graduate Research Fellowship
2010 Florida State University Outstanding Senior Scholar
2008 NOAA Ernest F. Hollings Undergraduate Scholar
2007 FSU Freshman University Scholarship
2007 Toyota Community Scholar
2006 Lemelson-MIT InvenTeams Invention Grant

Field Experiments

2014-6 Small Unmanned Aircraft Vehicle Experiment (SUAVE)
Assisted in mission planning and processed real-time dropsonde and radar observations aboard the WP-3D aircraft in support of NOAA/HRD's SUAVE missions into tropical cyclones.

2013 Crop Wind Energy Experiment (CWEX)
Independently calibrated a 35-channel scanning microwave radiometer, trained other graduate students to install and operate it, and provided remote troubleshooting assistance.

2012 AgI Seeding Cloud Impact Investigation (ASCII)
Deployed and independently maintained a disdrometer, microwave radiometer, and microwave rain radar in the Sierra Madre of southern Wyoming to observe winter storms.

2011 Boulder Snow Experiment
Used rapid scan mobile radar to investigate the role of valley winds in the development and maintenance of snow events in Boulder, CO.

2011 Radar Observations of Tornadoes and Thunderstorms Experiment (ROTATE)
Deployed surface observation stations and mobile radars to determine the three-dimensional low-level wind field and destructive potential of tornadoes.

2010 Verification of the Origins of Rotation in Tornadoes Experiment 2 (VORTEX2)
Deployed disdrometers and mobile radars to study the microphysics of supercell thunderstorms and its impact on storm evolution.

Peer-Reviewed Publications

Kalina, E. A., K. Friedrich, B. C. Motta, W. Deierling, G. T. Stano, and N. N. Rydell, 2016: Colorado plowable hailstorms: Synoptic weather, radar, and lightning characteristics. *Wea. Forecasting*, **31**, 663–693.

Friedrich, K., **E. A. Kalina**, J. Aikins, D. Gochis, P. Kucera, K. Ikeda, and M. Steiner, 2016: Raindrop size distribution and rain characteristics during the 2013 Great Colorado Flood. *J. Hydrometeor.*, **17**, 53–72.

Friedrich, K., **E. A. Kalina**, J. Aikins, D. Gochis, and R. Rasmussen, 2016: Precipitation and cloud structures of intense rain during the 2013 Great Colorado Flood. *J. Hydrometeor.*, **17**, 27–52.

Kalina, E. A., K. Friedrich, H. Morrison, and G. H. Bryan, 2014: Aerosol effects on idealized supercell thunderstorms in different environments. *J. Atmos. Sci.*, **71**, 4558–4580.

Kalina, E. A., K. Friedrich, S. M. Ellis, and D. W. Burgess, 2014: Comparison of disdrometer and X-band mobile radar observations in convective precipitation. *Mon. Wea. Rev.*, **142**, 2414–2435.

Cione, J. J., **E. A. Kalina**, J. A. Zhang, and Eric W. Uhlhorn, 2013: Observations of air-sea interaction and intensity change in hurricanes. *Mon. Wea. Rev.*, **141**, 2368–2382.

Friedrich, K., **E. A. Kalina**, F. J. Masters, and C. R. Lopez, 2013: Drop-size distributions in thunderstorms measured by optical disdrometers during VORTEX2. *Mon. Wea. Rev.*, **141**, 1182–1203.

Geerts, B., B. Pokharel, K. Friedrich, D. Breed, R. Rasmussen, Y. Yang, Q. Miao, S. Haimov, B. Boe, and **E. Kalina**, 2013: The AgI Seeding Cloud Impact Investigation (ASCII) campaign 2012: Overview and preliminary results. *J. Wea. Mod.*, **45**, 24–43.

Friedrich, K., J. K. Lundquist, M. Aitken, **E. A. Kalina**, and R. F. Marshall, 2012: Stability and turbulence in the atmospheric boundary layer: A comparison of remote sensing and tower observations. *Geophys. Res. Lett.*, **39**, doi:10.1029/2011GL050413.

Publications in Review

Cione, J. J., **E. A. Kalina**, E. W. Uhlhorn, A. M. Farber, and B. Damiano, 2016: Coyote Unmanned Aircraft System observations in Hurricane Edouard (2014). *Earth Space Sci.*, in review.

Publications in Preparation

Kalina, E. A., S. Y. Matrosov, J. J. Cione, F. D. Marks, J. Vivekanandan, R. A. Black, J. C. Hubbert, M. M. Bell, D. E. Kingsmill, and A. B. White, 2017: The ice water paths of small and large ice species in Hurricanes Arthur (2014) and Irene (2011). *J. Appl. Meteor. Climatol.*, in preparation.

Kalina, E. A., J. J. Cione, G. H. Bryan, D. H. Lenschow, and C. W. Fairall, 2017: Power spectra and eddy dissipation rate measured by the Coyote Unmanned Aircraft System in Hurricane Edouard (2014). *Geophys. Res. Lett.*, in preparation.

Uhlhorn, E. W., J. J. Cione, R. F. Rogers, J. Dunion, J. Zhang, B. Jaimes, L. K. Shay, and **E. A. Kalina**, 2016: Novel Observations in Hurricane Edouard of 2014. *Bull. Amer. Meteor. Soc.*, in preparation.

Zhang, J. A., J. J. Cione, **E. A. Kalina**, T. Hock, and J. A. Smith, 2017: Novel measurements of sea surface temperature in tropical cyclones obtained from GPS dropsonde. *J. Atmos. Oceanic Technol.*, in preparation.

Seminars and Conference Presentations

Cione, J. J., and **Coauthors**, 2017: NOAA's operational end game for the Coyote Unmanned Aircraft System. *97th Annual Meeting*, Seattle, WA, Amer. Meteor. Soc., 22 January 2017.

Bryan, G. H., J. J. Cione, N. A. Dahl, **E. A. Kalina**, J. K. Lundquist, D. S. Nolan, R. Rotunno, D. P. Stern, and R. P. Worsnop, 2016: Insights into tornadoes and hurricanes from high-resolution numerical simulations. *49th Fall Meeting*, San Francisco, CA, Amer. Geophys. Union, 12 December 2016.

Cione, J. J., and **Coauthors**, 2016: NOAA's operational path forward: Developing the Coyote UASonde. *49th Fall Meeting*, San Francisco, CA, Amer. Geophys. Union, 12 December 2016.

Kalina, E. A., J. J. Cione, G. H. Bryan, D. H. Lenschow, and C. W. Fairall, 2016: Power spectra and eddy dissipation rate measured by the Coyote Unmanned Aircraft System in Hurricane Edouard (2014). *49th Fall Meeting*, San Francisco, CA, Amer. Geophys. Union, 12 December 2016.

Kalina, E. A., S. Y. Matrosov, F. D. Marks, J. J. Cione, D. E. Kingsmill, M. M. Bell, R. A. Black, J. C. Hubbert, W.-C. Lee, J. Vivekanandan, P. P. Dodge, and R. F. Rogers, 2016: The fall speeds and ice water paths of small and large ice species in Hurricane Arthur (2014). *32nd Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Amer. Meteor. Soc., 11C.3, 20 April 2016.

Zhang, J. A., J. J. Cione, **E. A. Kalina**, E. Uhlhorn, T. Hock, and J. A. Smith, 2016: Novel measurements of sea surface temperature in tropical cyclones obtained from GPS dropsonde. *32nd Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Amer. Meteor. Soc., 19 April 2016.

Green, B. W., H. Winterbottom, **E. A. Kalina**, and J. J. Cione, 2016: Toward identifying and understanding errors in numerically simulated tropical cyclones: A case study of

Hurricane Edouard (2014). *32nd Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Amer. Meteor. Soc., 4D.5, 18 April 2016.

Cione, J. J., and **E. A. Kalina**, 2016: Factors that impact air-sea structure in hurricanes. *32nd Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Amer. Meteor. Soc., 3B.1, 18 April 2016.

Kalina, E. A., J. J. Cione, K. Friedrich, E. W. Uhlhorn, B. C. Motta, W. Deierling, G. T. Stano, and N. N. Rydell, 2015: Hurricanes and plowable hailstorms: Using novel observing platforms to improve forecasts of extreme weather events. Boulder, CO, David Skaggs Research Center, 13 August 2015.

Kalina, E. A., J. J. Cione, and E. W. Uhlhorn, 2015: Using Coyote Unmanned Aircraft System Observations to evaluate the Hurricane Weather Research and Forecasting (HWRF) Model. Boulder, CO, David Skaggs Research Center, 15 July 2015.

Cione, J., E. Uhlhorn, **E. Kalina**, and B. Damiano, 2015: Coyote UAS operations in hurricanes: Targeting critical data gaps to improve understanding and provide real-time observations to NOAA's operational centers. Boulder, CO, David Skaggs Research Center, 7 May 2015.

Cione, J., E. Uhlhorn, **E. Kalina**, and B. Damiano, 2015: Coyote UAS operations in hurricanes: Target critical data gaps; provide real-time observations to NOAA operational centers; improve understanding. *2015 Airborne Vertical Atmospheric Profiling System (AVAPS) Users Group Meeting*, Boulder, CO, National Center for Atmospheric Research (NCAR), 29 April 2015.

Kalina, E. A., 2015: Using radar, lightning, and model data to investigate severe thunderstorm microphysics. PhD defense, Boulder, CO, University of Colorado, 6 March 2015.

Cione, J. J., and **Coauthors**, 2015: NOAA's use of the Coyote UAS in Hurricane Edouard to enhance basic understanding and improve model physics. *69th Interdepartmental Hurricane Conference*, Jacksonville, FL, 2-5 March 2015.

Kalina, E. A., K. Friedrich, B. C. Motta, W. Deierling, G. Stano, and N. Rydell, 2014: Dual-polarization radar and lightning characteristics of Colorado plowable hailstorms. *2014 Earth System and Space Science Poster Conference*, Boulder, CO, University of Colorado, 14 November 2014.

Kalina, E. A., K. Friedrich, B. C. Motta, G. T. Stano, and N. N. Rydell, 2014: Plowable hail in Colorado: Overview, synoptic environment, and radar/lightning characteristics. Boulder, CO, David Skaggs Research Center, 20 August 2014.

Kalina, E. A., K. Friedrich, H. Morrison, and G. H. Bryan, 2013: Aerosol effects in a simulated supercell thunderstorm. *2013 University of Colorado Research Symposium*, Boulder, CO, University of Colorado, 1 November 2013.

Kalina, E. A., K. Friedrich, S. M. Ellis, and D. W. Burgess, 2013: Comparison of disdrometer and X-band mobile radar observations in convective precipitation. *36th Conference on Radar Meteorology*, Breckenridge, CO, Amer. Meteor. Soc., 16-20 September 2013.

Friedrich, K., and **E. A. Kalina**, 2013: Disdrometer and X-band mobile radar observations in convective precipitation. *VORTEX2 Workshop*, Balcones Springs, TX, 8-11 April 2013.

Kalina, E. A., K. Friedrich, H. Morrison, D. Dowell, and G. H. Bryan, 2013: Sensitivity of supercell thunderstorms to aerosol concentration and raindrop breakup. *VORTEX2 Workshop*, Balcones Springs, TX, 8-11 April 2013.

Friedrich, K., B. Geerts, J. Wurman, K. Kosiba, J. Aikins, and **E. Kalina**, 2012: Measuring snow characteristics with the dual-polarization Doppler on Wheels (DOW) radar during ASCII 2012. *Community Workshop on Radar Technologies*, Boulder, CO, National Science Foundation, 27-29 November 2012.

Worsnop, R. P., J. K. Lundquist, K. Friedrich, and **E. A. Kalina**, 2012: A comparison of remote sensing and in situ boundary layer measurements. *2012 Poster Conference for Atmospheric, Oceanic, and Related Sciences*, Boulder, CO, University of Colorado, 26 November 2012.

Kalina, E. A., K. Friedrich, S. Ellis, and D. W. Burgess, 2012: Comparison of disdrometer and X-band mobile radar observations in convective precipitation. *26th Conference on Severe Local Storms*, Nashville, TN, Amer. Meteor. Soc., 5-8 November 2012.

Friedrich, K., **E. Kalina**, F. Masters, and C. Lopez, 2011: Studying microphysical characteristics in supercell thunderstorms using mobile dual-polarization radars and mobile disdrometers during VORTEX2. Boulder, CO, National Center for Atmospheric Research (NCAR), February 2011.

Kalina, E. A., K. Friedrich, F. J. Masters, S. A. Higgins, and D. Nuding, 2010: Surface observations in supercell thunderstorms during VORTEX2. *2010 Poster Session for Atmospheric, Oceanic and Related Sciences*, Boulder, CO, University of Colorado, 1 December 2010.

Kalina, E. A., 2009: Developing surface enthalpy flux parameters to improve predictions of tropical cyclone rapid intensity change. *NOAA Science and Education Symposium*, Silver Spring, MD, 30 July 2009.

Conference Extended Abstracts

Kalina, E. A., K. Friedrich, H. Morrison, and G. H. Bryan, 2014: Aerosol effects on simulated supercell thunderstorms in environments with different relative humidity and vertical wind shear. *14th Conf. on Cloud Physics*, Boston, MA, Amer. Meteor. Soc., 292.

Kaplan, J., and **Coauthors**, 2010: Enhancements to the operational SHIPS rapid intensification index. *29th Conf. on Hurricanes and Tropical Meteor.*, Tucson, AZ, Amer. Meteor. Soc., 9C.4.

Leadership and Service

Reviewer
AMS Journal of Hydrometeorology, 2014–present
AMS Journal of Applied Meteorology and Climatology, 2012–present

Student Mentorship, 2013–present
Mentored two undergraduate students in the Significant Opportunities in Atmospheric Research and Science (SOARS) Program to help improve their computer skills and to produce effective research results from their summer projects at the University of Colorado. In addition, mentored a new graduate student in my research group to help him develop necessary research and computing skills.

Science Mentor, Lens on Climate Change, 2013–2014
Mentored six students from Poudre High School in their production of a video about Colorado drought, which was shown at a Cooperative Institute for Research in Environmental Sciences (CIRES) capstone event.

Volunteer Coordinator, Garnet and Gold Goes Green, 2008–2010
Led the student-run recycling program at Florida State University. I recruited, trained, and managed a team of ~50 volunteers that collected recyclables at university athletic events and that performed outreach in the Tallahassee community to teach citizens to lead more sustainable lifestyles.